UNITED STATES PATENT AND TRADEMARK OFFICE

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		EXAMINER
7590 04/07/2004		VIDA, MELANIE M

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Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 January 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,11,12,14,15,22 and 23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,11,12,14,15,22 and 23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
   Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.   This action is responsive to an amendment filed 1/16/04. Claims 1-6, 11-12, 14-15, and 22-23 are pending. Claims 7-10, 13, and 16-21 are cancelled.

Response to Arguments

2.   Applicant's arguments, see Paper Number 6, page 7, filed 1/16/04, with respect to the rejection(s)of claim(s) 1 under 35 U.S.C. 102(b) has been fully considered and are persuasive. It is agreed that MacDonald does not teach the added limitation in claim 1, "converting the first gamut in CMYK color space to a gamut in a color space having a lightness component", (pg. 7, paragraph 6). In claim 4, it is agreed that MacDonald does not teach the added limitation, "a first gamut in CMYK color space". Finally, MacDonald does not teach the added limitation in claims 10 and 12, "changing a lightness component of the CIELAB space gamut to form an enhanced CIELAB space gamut". Therefore, the rejection has been withdrawn. However, upon further search, a new ground(s) of rejection of Decker et al. US-PAT-NO: 5,987,168 is applied below.

Claim Rejections - 35 USC § 112

3.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4.   **Claims 1-3, 4-6, 11-12, 14-15, and 22-23** are rejected under 35 U.S.C. 112, second

paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject

matter which applicant regards as the invention.

Claim 4 recites the limitation "the gamut in the CMYK color space" in line 4, page 3.

There is insufficient antecedent basis for this limitation in the claim.

Claim 4 recites the limitation "in the CMYK color space" in line 5, page 3. There is

insufficient antecedent basis for this limitation in the claim.

Claim 4 recites the limitation "the full CMYK color space" in line 6, page 3. There is

insufficient antecedent basis for this limitation in the claim.

Claim 11 recites the limitation "the a CMY space" in line 2, page 3.

There is insufficient antecedent basis for this limitation in the claim

5.   The Applicants have amended **claims 2-3** with claim language that is unsupported in the

specification. The Examiner cites the specification, wherein it states the following:

> "In another embodiment, a gamut in a CMY color space having an upper surface
> and a lower surface is converted to a gamut in a CMYK color space having a bottom
> surface. The gamut in the CMYK color space is converted to a gamut in a CIELAB color
> space and the gamut in the CIELAB color space has a lightness component. The gamut in
> the CIELAB color space is modified by changing the lightness component such that the
> upper surface of the gamut in the CMY color space is preserved and the lower surface in
> the CMY color space is mapped to the bottom surface of the gamut of the CMYK color
> space to form an gamut in an expanded CIELAB color space", (pages 2, line 27 through
> page 3, line 5).

This is contrary to claim 2, which states, "modifying the gamut in the color space having

a lightness component by changing a lightness component of a color value in the color space

having a lightness component such that the upper surface of the first gamut in the CMYK color

space is preserved and a lower surface of the first gamut in the CMYK color space is mapped to

a bottom surface of the gamut of the full CMYK color space to form an expanded gamut in the

color space having a lightness component", (claim 2, lines 4-9).

In conclusion, it appears to the Examiner that the "rescaling of the lightness component

in the CMYK color space", as stated in claim 2, and "rescaling of the lightness component in the

CMY color space" as stated in the specification, are contradictory to the embodiment of the

invention.

Appropriate correction is required.

6.   Regarding, **claims 1-6, 11-12,** the Applicants state that the first gamut is in CMYK color

space, (claim 1, line 2-3; claim 4, lines 2-3; claim 6, lines 1-3 and 6; claim 11, lines 2-3; claim

12, lines 2-3; claim 1). However, it appears to the Examiner that the CMY color space is the first

gamut color space, and that CMYK is the second color gamut, because the CMYK gamut is

derived from CMY gamut.

7.   **Claim 5** is rejected under 35 USC second paragraph for depending on rejected claim 4.

        Claims 14-15 are rejected under 35 USC second paragraph for depending on rejected

claim 12.

        Claims 22-23 are rejected under 35 USC second paragraph for depending on rejected

claim 11.

        Appropriate correction is required.

                                Claim Rejections - 35 USC § 102

8.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

9.   Claims 1, 2-3, 11-12, 14, and 22 are rejected under 35 U.S.C. 102(e) as being anticipated by Decker et al. US-PAT-NO: 5,987,168, (hereinafter, Decker).

Regarding, claim 1, as best understood from the claim language, Decker teaches a method of color conversion from a 3D color space to a 4D color space as shown in figure 1, which reads on "a method comprising:" (col. 4, lines 36-41; col. 7, lines 24-28).

In step (102) CMY:3 Col Matrix for N(729, 9x9x9) patches are input to a gray component replacement program step (122), which reads on "converting a gamut in CMY color space" and outputs in step (124) CMYK Measure for (L*a*b*)ks (126), which reads on "to a first gamut in a CMYK color space", (col. 4, lines 38-54; col. 7, lines 25-29; col. 8, line 60 through col. 9, line 4 and lines 36-39).

Moreover, in step (128), Decker states that a 7-column table is produced having the new CMYK, which reads on "converting the first gamut in CMYK color space" and the

corresponding L*a*b* values, which reads on "to a gamut in a color space having a lightness

component;" (col. 9, lines 31-35).

Decker teaches to insure the accuracy of the inversion and interpolation algorithms, it is

important that the L*a*b* nodal points associated with C'M'Y'K' are very close to those

established for (CMY)p, which reads on "rescaling a lightness component of a gamut color space

having a lightness component to form a modified gamut", (col. 9, lines 46-49).

Finally, Decker teaches that the (L*a*b*)p (130) is inverted to obtain the new (CMYK)k

(138), which reads on "converting the modified gamut to a second gamut in a CMYK color

space", (col. 9, lines 50-51).

Regarding, **claim 2,** as best understood from the claim language, Decker teaches an

algorithm for deriving a table of CMY for each value of K in terms of L*a*b* called (CMY)k,

where a* and b* are equal to zero, and also a second table having the new values of CMYK and

the corresponding L*a*b* values from the original sample patches, which reads on "rescaling a

lightness component of a gamut in the color space having a lightness component to form a

modified gamut", (col. 8, lines 33-36; col. 9, lines 31-35).

Decker teaches that K values are associated with the K values from the greyscale patches

read, which reads on "modifying the gamut in the color space having a lightness component of a

color value in the color space having a lightness component", (col. 10, lines 55-58). A step for

every non-zero CMY, the K versus CMY table is used to find the greatest K percentage where

the corresponding (CMY)k when subtracted from (CMY)p do not result in any negative values,

which reads on "such that the upper surface of the first gamut in the CMYK color space is

preserved and a lower surface of the first gamut in the CMYK color space is mapped to a bottom

surface of the gamut of the full CMYK color space to form an expanded gamut in the color space

having a lightness component", (col. 8, lines 48-65; col. 9, lines 5-16).

Regarding, **claim 3,** Decker teaches that the original CMYp table is modified with a

CMY vs. K LUT (i.e. lookup table), and a difference between (CMY)p and (CMY)k derives the

CMYK color space, which reads on "converting a gamut in a CMY color space to a first gamut

in a CMYK color space", (col. 9, lines 20-30). Additionally, Decker teaches of a second step

involving a K (i.e. black) substitution so that the original (CMY)p is modified with K versus

(CMY)k table, and a difference between (CMY)p and (CMY)k forms the CMYK gamut, which

reads on "applying a black generation method to the gamut in the CMY color space to form the

first gamut in the CMYK color space", (col. 8, lines 48-51; col. 9, lines 20-28).

Regarding, **claim 11,** Decker teaches a method of color conversion from a 3D color space

to a 4D color space as shown in figure 1, which reads on "a method comprising:" (col. 4, lines

36-41; col. 7, lines 24-28).

In step (102), CMY:3 Col Matrix for N(729, 9x9x9) patches are input to a gray

component replacement program step (122), which reads on "transforming the CMY space

gamut" and outputs in step (124) CMYK Measure for (L*a*b*)ks (126), which reads on "to

obtain a first CMYK space gamut by including a black colorant in the CMY space gamut", (col.

4, lines 38-54; col. 7, lines 25-29; col. 8, line 60 through col. 9, line 4 and lines 36-39).

Moreover, in step (128), Decker states that a 7-column table is produced having the new

CMYK values, which reads on "transforming the first CMYK space gamut to form" and the

corresponding L*a*b* values from the original 9x9x9 sample patches, i.e., (L*a*b*)p, which

reads on "a CIELAB space gamut by printing a plurality of patches and measuring each of the

plurality of patches to obtain the CIELAB space gamut;" (col. 9, lines 31-35).

A look up table can be made correlating C'M'Y'K values with the new corresponding

L*a*b* values, which reads on "changing a lightness component of the CIELAB space gamut to

form an enhanced CIELAB space gamut", (col. 9, lines 38-44).

Finally, Decker teaches that the L*a*b* (130) are inverted to obtain the new CMYK

(138), which reads on "transforming the enhanced CIELAB space gamut to form a second

CMYK space gamut", (col. 9, lines 50-53).

Regarding, claim 12, Decker teaches a method of color conversion from a 3D color

space to a 4D color space as shown in figure 1, which reads on "a method comprising", (col. 4,

lines 36-41; col. 7, lines 24-28).

In step (102), CMY:3 Col Matrix for N(729, 9x9x9) patches are input to a gray

component replacement program step (122), which reads on "transforming the CMY space

gamut" and outputs in step (124) CMYK Measure for (L*a*b*)ks (126), which reads on "to a

first CMYK space gamut by including a black colorant in the CMY space gamut to form the

CMYK space gamut", (col. 4, lines 38-54; col. 7, lines 25-29; col. 8, line 60 through col. 9, line 4

and lines 36-39).

Moreover, in step (128), Decker states that a 7-column table is produced having the new

CMYK values, which reads on "transforming the first CMYK space gamut to form" and the

corresponding L*a*b* values from the original 9x9x9 sample patches, i.e., (L*a*b*)p, which

reads on "into a CIELAB space gamut by computing the CIELAB space gamut from a model

capable of mapping the CMYK space gamut into the CIELAB space gamut;" (col. 9, lines 31-35).

A look up table can be made correlating C'M'Y'K values with the new corresponding L*a*b* values, which reads on "changing a lightness component of the CIELAB space gamut to form an enhanced CIELAB space gamut", (col. 9, lines 38-44).

Finally, Decker teaches that the L*a*b* (130) are inverted to obtain the new CMYK (138), which reads on "transforming the enhanced CIELAB space gamut to form a second CMYK space gamut", (col. 9, lines 50-53).

Regarding, **claim 14,** Decker teaches of a look up table can be made correlating C'M'Y'K values with the new corresponding L*a*b* values, which reads on "changing a lightness component of the CIELAB space gamut to form an enhanced CIELAB space gamut", (col. 9, lines 38-44).

Regarding, **claim 22,** Decker teaches of a look up table can be made correlating C'M'Y'K values with the new corresponding L*a*b* values, which reads on "changing a lightness component of the CIELAB space gamut to form an enhanced CIELAB space gamut", (col. 9, lines 38-44).

Claim Rejections - 35 USC § 103

10.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

11.   **Claims 4-6, 15, 23** are rejected under 35 U.S.C. 103(a) as being unpatentable over

Decker, US-PAT-NO: 5,987,168, as applied to claims 1, and 11-12, above, and further in view of

Lin et al. US, Patent No. 6,185,004 (hereinafter, Lin).

Regarding, **claim 4,** Decker teaches a method of color conversion from a 3D color space

to a 4D color space as shown in figure 1, which reads on "a method comprising:" (col. 4, lines

36-41; col. 7, lines 24-28).

Decker teaches a step (102) wherein CMY: 3 Col Matrix for N (729, 9x9x9) patches are

input to a gray component replacement program (122), which reads on "converting a gamut in a

CMY color space having an upper surface and a lower surface" to a first gamut in a CMYK color

space, which reads on "to a first gamut in a CMYK color space", (col. 9, lines 31-35).

Moreover, in step (128), Decker states that a 7-column table is produced having the new

CMYK, which reads on "converting the first gamut in CMYK color space" and the

corresponding L*a*b* values, which reads on "to a gamut in a CIELAB color space, the gamut

in the CIELAB color space having a lightness component;" (col. 9, lines 31-35).

Decker does not expressly disclose, "modifying the gamut in the CIELAB color space by

changing the lightness component such that the upper surface of the gamut in the CMY color

space is preserved and the lower surface in the CMY color space is mapped to the bottom surface

of the gamut of the CMYK color space to form a gamut in an expanded CIELAB color space;

and transforming the gamut in the expanded CIELAB color space to form a second gamut in the

CMYK color space".

However, Lin teaches that to modify the gamut in the CIELAB color space the lightness

component, L, of the lower surface of the scanner gamut is rescaled $L^*=0$ to 40 into $L^*=30$ to 40

of the (CMYK) printer gamut, and leaving the upper levels of the scanner gamut $L^*=40$ to 100

unchanged, which reads on "modifying the gamut in the CIELAB color space by changing the

lightness component such that the upper surface of the gamut in the CMY color space is

preserved and the lower surface in the CMY color space is mapped to the bottom surface of the

gamut of a full CMYK color space to form a gamut in an expanded CIELAB color space, (col.

15, lines 53-60). Further, Lin inherently teaches, "transforming the gamut in the expanded

CIELAB color space to form a second gamut in the CMYK color space" as evidenced by the

printer gamut which is an indication that the output device dependent color space must be a

CMYK gamut in order to print, and as further evidenced by figure 1, wherein the output device

map (23) is converted from device independent color space (DICS) to an output –device

dependent color space (DDCS), (31), (col. 5, lines 37-43; col. 15, lines 53-60).

At the time the invention was made, it would have been obvious to one of ordinary skill

in the art to modify Decker's method with Lin's CIELAB conversion into a CMY gamut.

One of ordinary skill in the art would have been motivated to use the CIELAB to CMYK

gamut conversion technique taught by Lin because two devices may have the same upper limit

but different lower limits, given the express suggestion of Lin, (col. 15, lines 45-49).

Regarding, **claim 5,** please refer to the corresponding rejection in claim 2.

Regarding, **claim 6,** please refer to the corresponding rejection in claim 3.

Regarding, claim 15, Decker teaches the method of claim 14, but fails to expressly

disclose, "computing a rescaling factor that is a function of an L_{min}, and L_{max}, and an L_{mincmy}".

However, Lin teaches of mapping the minimum luminance level for a neutral color in the

printer gamut, by compressing the luminance level, which reads on "computing a rescaling

factor", with the factors $L^*=0$, which reads on "L_{min}", and $L^*=100$, which reads on "L_{max}", and

$L_x=40$, which reads on "L_{MINCMY}", (col. 15, lines 54-60).

At the time the invention was made it would have been obvious to one of ordinary skill in

the art to modify Decker's method with Lin's method of rescaling luminance values.

One of ordinary skill in the art would have been motivated to rescale the luminance

values because the side-effect from converting from a CMY to CMYK, a 3D to 4D conversion,

is that the process are based on theoretical colors and color relationships, and a printer may not

be capable of producing the theoretical colors, given the express suggestion of Decker, (col. 5,

lines 23-28).

Regarding, claim 23, please refer to the corresponding rejection in claim 15.

Conclusion

12.   The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure.

Chang et al. US-PGPub : 2002/0113982 A1, black generation method for CMYK color

printer using lookup tables and interpolation.

13.   Applicant's amendment necessitated the new ground(s) of rejection presented in this

Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this

final action.

14.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Melanie M Vida whose telephone number is (703) 306-4220.

The examiner can normally be reached on 8:30 am 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Kimberly A Williams can be reached on (703) 305-4863. The fax phone number for

the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Melanie M Vida
Examiner
Art Unit 2626

MMV

KIMBERLY WILLIAMS
SUPERVISORY PATENT

April 2, 2004